

Field methods in the study of toxic cyanobacterial blooms: results and insights from the Lake Erie experience

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Abstract

A sound basis in field methodology is a prerequisite for gaining a basic understanding of toxic cyanobacteria blooms. Sample collection, on-site processing, storage and transportation, and subsequent analysis and documentation are all critically dependent upon a sound field program that allows the researcher to construct, with as much possible certainty, linkages between bloom events and cyanotoxin production with the ecology (both natural and anthropogenically influenced) of the system in question. Since 1999, we have been collecting samples in Lake Erie as part of the MELEE and MERHAB research programs in an attempt to both develop appropriate tools and methods to characterize the ecology of the reoccurring cyanobacterial blooms in the systems. Satellite imagery, large ship expeditions, classical and novel molecular tools have been combined to provide insight into both the cyanobacteria responsible for these events as well as into some of the environmental cues that may facilitate the formation of toxic blooms. This information, as well as insights on new directions in cyano-specific monitoring will be presented to highlight considerations that need to be made with respect to field programs focused on either monitoring or research toxic freshwater cyanobacteria.